Energy policy review for EU accession countries, The case of Croatia

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Abstract

The paper attempts to cover the current status and progress of the energy chapter between the European Union and Croatia, one of the three members that are pending accession to the parent body. The development of the energy sector in post-war Croatia has been slow with state control over most of the resources, but the transition to the EU will alter this into a more flexible and rapidly growing one, with industrial and consumer demand expected to rise. The paper discusses the creation of a single energy market, its implications, obstacles and recommendations.

Introduction

The concept of a coherent Energy Policy incorporating the different dimensions of energy demand, security, infrastructure and concerns for related environmental implications is gaining importance for constructing a comprehensive roadmap for sustainable economic growth. The European Union has over the past years reformed and liberalized energy markets to promote trade and competition amongst Member States, while reducing transaction costs through this process of integration. This model of economic governance has been considered highly successful and efforts to include peripheral nations are underway with great enthusiasm, furthering mutual gains from free markets and correction from imbalances. Currently, the EU is under negotiations with Croatia, Macedonia and Turkey as candidate countries for eventual accession. The energy policies of these nations will be an important topic of discussion for both parties and how they could be realigned with the supranational interests of the EU.

The paper focuses on Croatia’s accession status with regards to its energy policy and measures implemented to adapt smoothly to EU criterion. Croatia has proved to be a suitable candidate due to its impressive political and economic recovery after the dissolution of former Yugoslavia and is expected to show one of the highest energy demand growths in Europe. The EU opened the chapter on energy in early 2008 as part of the accession process with Croatia keeping the same in mind, and this paper endeavors to review the proposed developments as well as the present situation of the energy sector. Croatia is expected to show robust economic growth in the next few years and it is understandable that the energy demand will show a similar pattern. The integration with the EU throws up an opportunity to conduct a detailed analysis of Croatia’s energy policy along with its strengths and shortcomings.

The paper is divided into five main portions that broadly outline the progress and prospects of the accession requirements- security of supply, investment scenario, internal electricity markets, potential for growth of renewable energy and environmental obligations. A section on results discusses the main findings and another concludes this analysis.

Security of supply

One of the main objectives of securing a regional energy market in the Balkans is to ensure a steady supply of energy and the integration with the EU entails this aspect as one of its major ones. Perfect competition theories suggest that the market itself would balance out and no intervention is needed provided the market assumes the liquidity and transparency that is targeted. But the effect on security is particular with regards to oil price volatility and storage. Croatia is dependant on substantial imports – little over a half of its primary consumption- to meet its energy needs and storage capacities have to be built for a minimum of 90 days consumption as per the official EU policy. At the time of writing, there is still the need to construct further capacity for 35 days with an estimated investment of 200 million USD. Little can be said about how the integration will hedge the local markets from oil price volatility. There is scope of increased gasification in the region, which is also to serve as a transit zone for the EU for gas from the Caspian zone. But it does little to ensure an uninterrupted supply of energy as natural gas is in turn dependant on other fossil fuel prices and is also geo-politically sensitive. The interconnection of the different energy markets in the Balkans will reduce transaction costs at the international borders and there is a sense of easy access to EU markets that could help in the longer term.

Internal electricity markets

In perfect competition, each player in the market is supposed to have minor impact on the prices. On the other hand, monitoring bodies ensure that the market should not be limited to only a few players. However, electricity sectors are usually state dominated and monopolistic due to historical developments. The EU market can be considered in its development stage as a whole but is projected to evolve towards an ultimate liberal market. However, the diligence of further liberalization within the EU has accentuated lately and market players are now encountered with more regulation.

The electricity sector in Croatia has undergone structural changes since post-Yugoslavia times. The aim is to open the market to private investors and to foster liberalization, as is the common practice globally. Liberalization has been accelerated following the EU candidacy process and is expected to be in line with the set targets upon closing the Energy chapter. The transition from a communist state in the pre-1980s to a market leaning towards the EU has experienced the adverse effects of the disintegration of nations. But the stabilization in the Western Balkans, economic interest in the EU and reconstruction of the damaged infrastructure has led the markets to be more linked with each other via higher trade volumes and more cooperation. The term *self-dependency* has been replaced by mutual gain, which reflects a regime shift both in Croatia and other countries.

Before the market restructuring was initiated, Croatia used to show very similar characteristics of ex-Yugoslavia states: vertically and horizontally integrated electricity state - dominated companies, no third party access, non-cost reflective electricity prices, non-dispersed ownership of Transmission System Operators between states, lack of investment and political interests. Since then, the emphasis has been on reform and a market approach rather than a utility for social benefit. In Croatian electricity market today, HEP the parent company deals with electricity production and sale, CRISMO, as the market operator, is responsible for organizing the day-ahead market, and the transmission part of HEP-OPS, the transmission company, provides ancillary services lest some imbalances occur. HERA acts as the regulatory authority, whose duties include monitoring the market and executing secondary legislations.

Thermal power plants serve as the main source of generation with an increasing use of natural gas due to domestic production. Hydro power roughly produces 30% of the whole consumption and lack of production owing to scanty rain fall is substituted by imports. The estimated gap between generation and consumption is projected to grow because of the imbalances between investment and consumption growth rates. Increasing electricity imports do not directly lead to insecurity, but expose the domestic market to occurrences in the exporting countries and reliance on fuel price changes. Considering the time lag between the investment decision and operation of power plants, the country might also face power shortages. The investment for a 400-500 MW thermal power plant by 2010 and another 600-700 MW plant is needed. This numbers will grow larger once the losses due to the old plants have been taken into account.

The main legislative changes date back to 2001 in order to help the market function properly. For instance, a new grid code has been defined, cross country capacity allocations have been drawn to a more competing environment and new rules easing the liberalization have been set out. These legislations have been also designed in line with the EU legislations with the target of full EU membership. By signing the Athens Memorandum initiated by EU in 2002 with the South East European countries, the country has been in the process of further integration with the South East Europe Regional Energy Market (SEEREM) and also outside the region. Connection of Croatia through The Union for the Co-ordination of Transmission of Electricity (UCTE) to the rest of Europe allows the country to enter into electricity trading while diminishing the imbalances between markets to some extent. The vertical and account unbundling has been completed by dividing the integrated HEP into three units: generation, transmission and distribution. Although the vertical separation could be accomplished quickly, the horizontal unbundling hasn't taken place yet, allowing the state utilities to keep their monopolistic power. Functional unbundling which deals with the separation of managerial teams is yet to materialize.

In the transformation to an open and liberal market, profitability, transparency, perception towards market entry and social benefit dominates investment decision mechanisms. In terms of these four criteria, the Croatian electricity market needs improvements despite considerable progress.

The profitability of HEP raises some concerns regarding the ability of the company to cope with the changing dynamics in the region. Croatia as a net importer of electricity, accommodates HEP and a few electricity producers. As a fully state owned enterprise, the deficits or overcharges of HEP needs to be somehow compensated by the whole nation. This cross compensation mechanism would result with passing the costs on to the unrelated parties. As a result, the inefficiency in utility would be undermined and the investments would be probably delayed. On the other hand, the market would be driven with more inefficiency since the customers do not have the right to switch from a more expensive supplier. Market opening to all customers has been achieved in 2008, but, making all the customers eligible is still behind the schedule.

Transparency plays a key role during market openings, since it is usually perceived as the reliability of the market indicators and a reference for long term investments. Essential data is available, especially on day-ahead markets and cross border trades. One drawback could be the ambiguity of electricity prices. The tariff system is indeed cost reflective than most SEEREM countries, despite the fact that prices are usually high.

Willingness to open markets and the signals created by the government are not at standards required by prospective investors. This could partly be explained by implicit obstacles such as bureaucratic procedures as the regulatory reforms have already taken place up to a satisfactory level. One other reason is the monopolistic position of HEP in the market. Although CROISMO is a separate legal entity that coordinates the daily auctions, any possible hostile actions by HEP could result in high risk operations reflected in price or long term bilateral contracts for hedging. As a major contractor for electricity import and export of Croatia, the scope for trading would be significantly reduced as long as HEP exercises monopoly power. For new entrants, third party access to the network is one of the milestones for creating a competitive environment. The current legislation states that the transmission company ensures the third party access with given technical and operational constraints. The extent which the legislation is applied in practice is a new area for research. Strong ties between state owned companies, although legally separated, could raise questions on irrational bias toward system users.

Market opening could be additionally analyzed with reference to cross border trading owing to the fact that the electricity trade is almost equal to annual domestic consumption. The major enhancements in this regard could be summarized with transmission allocations via UCTE re-connection, more cooperation with The Energy Treaty, congestion management and inter-TSO compensation schemes, all of which have been redefined during the market liberalization.

Following the establishment of The Country, a sound progress has been made on international coordination and trade. A re-synchronization with UCTE took place in 2002; the completion of the coordination process was ultimately finalized in late 2004. Although Croatia was a part of UCTPE, previous form of UCTE, the re-synchronization has been lost as a result of the damage to infrastructure during the wars. Upon the restoration and construction of the main transmission routes in the region, the physical barriers for cross border trades could be easily eliminated. Croatia as a part of 1st UCTE synchronous zone and linked with 2nd UCTE synchronous zone, could also yield the advantages since UCTE stands for the standardization of technical operations, reliable operation and more transparency.

After signing the act of The Athens Memorandum of Understanding in 2002, South East European countries including Croatia, the region has entered into an era of more cooperation and a full regional integration. As a reflection of the inclusion process, The Energy Treaty between EU and SEE countries has been established in 2005 and came into force in July 2006. On the basis of EU directives, Treaty outlines a framework for the electricity transmission and permits a market integrated approaches similar to EU legislation. Treaty in fact contains an agglomerate of whole energy, environment and competition provisions; to be more specific, an electricity market concentration will be devoted.

As one of the main goals of Treaty, Croatia and other countries are expected to create a stable regulatory and market environment where the competition functions properly and power supply, transmission and distribution is carried flawless. Croatia has adopted some sub-legal documents, which regulates the cross border schemes in the Treaty manner. Although most of the essential legal structure is in place, some challenges delay the implementation of the rules; hence, deadline promises enforced by the Treaty have not been fulfilled. The main challenges in this process can be listed as follows: plenty of time needed to accomplish, lack of institution and administration capacity and conflict of national versus regional interest. On the other hand, Croatia can also use the advantage of pre-EU experience, investment attraction, harmonized decision mechanisms which make the whole region better off, energy security increase due to focus on long term and sustainable energy policies. Apart from all, the Treaty would also facilitate the EU negotiation process more proactively and The Energy Chapter could be dealt in a shorter time. The Report on Implementation of Acquis also highlights some issues on cross border trading, advising that cross border capacity allocations and supporting HERA’s regulatory power and institutional autonomy should be improved.

With reference to allocation of cross border transmission capacity, Croatia’s main goal has been entailed as the maximum use of available interconnection capacity. The country is linked to neighboring countries except Montenegro with approximately 3040 MW net import and 2500MW net export capacities by 2007/2008 figures. The ratio of theoretical maximum import capacity to generation is 75%, highest in the region. The physical flow between the partner countries has been increasing; therefore management of the cross border trade becomes more noteworthy. In charge of transmission and capacity allocations, both publicly owned HEP-OPS and HEP-Operator prijenosnog sustava d.o.o is placed on the operation side.

Croatia has been applying methods of pro-rata for monthly and priority list for daily allocations and there is a gradual transition to explicit auctions. This method is usually reckoned as a non-market based approach, which is mainly relied upon the historically developed relations between TSO operators. This method mainly gives more credit on historical use of the capacity. Although these methods might have been useful in the war era as it allow for more manual decisions, the market would perceive very arbitrary due to the fact that decision making mechanism is ultimately left in the hands of transmission company. Priority listing also discourages late entrants due to limited transparency, very low congestion rent and incumbents with a large number of customers who started earlier. Pro-rata mechanism distributes the excessively demanded capacities with a ratio to the amount of the bids. Although this method has been revised as easy to implement, it leaves the market very vulnerable to gaming, arbitrary prices set by Authorities, little congestion rent and non-standardization.

In order to make sure that the competition is not distorted, explicit auctions have been suggested within Energy Community Treaty process. In this method, transmission company collects the bids from different traders for a certain amount of capacity and find the optimal with the given demand condition. The equilibrium would serve as a reference price for the market and winning players would be allocated with the optimized transmission capacity. Coordinated flow based explicit auction is able to work with relatively low generations in different countries partially linked to each other. This method organizes the investments to the capacities in a need order and brings a fair revenue allocation mechanism. Some other advantages like increased economic efficiency, maximization of available capacities, transparency, easy operation and ability to work with different type of trade and contracts have cited in some sources. Some early simulation results also indicate that the region as a whole can make significant cost reduction by implementing this auctioning method for congestion management. Although this understanding is gaining more ground, there is a need for an institutional capacity compatible to work with auctioning. On the other hand, allocation of resource more efficiently does not remove the necessity of infrastructure investment; on the contrary, Croatia can make significant reductions in imported electricity costs.

It is also wise to mention that SEE region also enhanced in the coordination of infrastructure investments, mainly in transmission networks. Joint investment where the congestion occurs would bring the countries closer to a win-win situation. EU Progress Report also pointed the abolishment transit fees after joining inter-TSO compensation mechanism.

The final criterion, social benefit to the public, has been one of the highest concerns. Although electricity is one of the major inputs to the industry and a consensus over how to deregulate has not yet been reached, there is certainly a binding tendency posed by EU and the competitive forces to initiate this mechanism. The investments needed to tackle with climate change are also another factor which requires a comprehensive understanding on balancing social goods.

Investment scenario

The attractiveness of the market in terms of investment into generation and grid infrastructure is promising but riddled with high costs and uncertainties. Major investment is likely to be driven into fossil fuel (gas and oil) based plants and healthy macro-economic figures will make this more feasible. The cost of capital is considerably higher as compared to the Euro zone with large interest spreads. The competitive advantage of low cost labor is stunted by a short term dimension as the labor laws are restrictive. Leakage and inefficiency in the administrative capacity are other hindrances to investment. There are indications of a big bang approach that entails mass privatization that will also act as a demonstration effect to the other Balkan states, but there are political disincentives against the same as the state owns the very assets that require divestment. The region may serve as a transit point for natural gas into the Euro zone and thus the presence of national champions and ineffective pricing could make costs of transportation escalate. Regulatory alignment and transparent accounting will aid in establishing a lucrative market that can attract investments.

Potential for growth in renewable energy sources (RES)

The status of renewable or ‘green’ energy is ambiguous in Croatia as a little over a half of the total installed capacity of the power system is derived from non-fossil fuel sources, but most of this is mainly from large hydroelectric plants, now considered to be environmentally unsustainable. Excluding this, the figure looks minimal, with a 0.7 % (2007) share. Croatia has however set a short term target of 5.8 % of the total electricity consumption from renewable sources for 2010, as the EU has important directives that need a sizeable minimum share of RES.

The potential for biomass looks bright with high consumption in rural areas set to grow even more as unused resources like waste, wood industry waste, agricultural waste could be put to good use. An ambitious target of 15 % of total primary energy consumption until 2020 that hopes to fully utilize the biomass potential of the country has been set. In spite of this, the current strategy puts wind power as a top priority, explained due to the ease in technology transfer from the EU and the presence of lucrative sites within Croatia, with potential to the tune of 400 MW. This is again contradicted by the limited and large spread of such sites which may prove costly for generating and transporting power over large distances. Again, the current scale of operation is minimal with just under 10MW of installed capacity. Studies also show that Geo-thermal sources have good potential for development, with close to 900 MW of thermal power and 50 MW of electric power.

A set of programs that each deal with different RES has been initiated, but it could result in a scattered effort with little realistic implications. A legal procedure for being a producer of RES has been put in place but it remains to be seen how competitive and liquid the market is allowed to be as the chief participant is still a part of the main energy producer, HEP. There is a fixed tariff system in place for RES to promote their growth with Solar Photovoltaic sources being the most expensive and Wind and Small Hydro (expected potential of 100 MW) being the cheaper options by almost a third. A number of joint undertakings have been concluded with foreign firms to acquire technology and capital and are steps in the right direction. Among other initiatives, the average monthly electricity bill has been increased as each consumer does pay an extra RES fee for every kWh spent, 0.27 –0.55 € for an average household, a fee which has grown every year since its inception and is used to finance ‘green’ projects. The fee can however result in inefficiency and could end up penalizing household consumers and distorting markets if it is not optimally derived from the market equilibrium. Moreover, the credibility of the parent body with regards to optimal use of this tax is in doubt. Investment analysis should consider highest returns from the various sources leaving aside political and bureaucratic concerns to remove obstacles in the growth of RES. Cross-subsidization of RES is recommended, as in most energy markets.

Croatia performs poorly in the Multi Decision Criteria Model. It explains the operational environment of RES - political, legal, financial, social-cultural and technological - in the country with respect to other EU nations in Eastern Europe. Concrete steps that can actualize the ‘green’ potential must include the setting up of a transparent and competitive spot market but the investments in such projects must be supported by standardized long term contracts for market penetration, size and share. A long term view and strong political will must allow RES to gain a foothold in this market. The lack of a coherent policy and data still prevents a clear understanding of the RES initiative in Croatia and the intuitive belief is that the region will gather large investments in cheaper fossil fuel sources that may crowd out the emergence of a cleaner section in the energy market.

Environmental Obligations

The environmental policy in Croatia seems to focus primarily on air quality and waste management – albeit with an impressive record in such practices. The main threat to its environment is however, coastal degradation, crucial to its tourism potential and of course, climate change. It can be safely said for the latter at least, Croatia has some way to go before the accession requirements are duly met in the areas of environmental standards. A review of the literature available does reveal that Croatia will have to make stern efforts to expedite the process of regulating its green house gas emissions in order for it to smoothly achieve acceptable levels.

Monitoring and measurement of emissions from thermal power stations is being emphasized with the setting up of a network for air quality measurement - although it needs to be upgraded. Another study of external costs (in monetary values) produced from thermal power plants concludes comparable figures to that of the EU, but seem lower on adjustment since Croatia has a low GDP and the assumed emission rates are higher with the impact being local to the region.

There has been a marked improvement in the reduction of sulfur emissions and particulate matter over the past few years, but the same cannot be said for nitrogen and carbon emissions. Current data collected at the time of writing showed low cumulative emissions, which could be on account of low economic activity due to the global impact of a recession. In forecasting terms, the period from 2000 to 2020 is roughly assumed to show the following growth - GDP by 4.6 percent, total energy demand by 2.0 percent, CO_2 emission by 2.8 percent, and electricity consumption by 3.0 percent. The GHG emissions in 2010 are expected to be 10 percent to 22.5 percent higher than 1990 levels. In all probability, Croatia will not be able to prevent a breach in its Kyoto emission ceiling in the short term. Mitigation costs could range between USD 30-40 per tone of carbon dioxide and thus the European Carbon Trading System would seem a favorable option in future, giving Croatia all the more reason to work on its accession efforts. Progress on that front again, is slow.

There has been substantial financial assistance that has been guaranteed by the World Bank and a German financial institution over recent times. The appropriate use of such funds will surely mitigate environmental threats to Croatia’s coastal regions and landscape. Further support from other bodies within the EU would be welcome as domestic investments are inadequate and mainly driven into waste management although air quality and climate change are developing areas of concern.

The compliance with the Kyoto Protocol targets seems improbable even under cases of drastic action and high costs for abatement. This further suggests that incentivizing renewable energy and increasing energy efficiency are measures crucial to aiding a sound environmental policy. The usual strategy does not give room for improvements and much needs to be done in terms of investment, regulation and information dissipation. It clearly seems that the chapter on environment will only be completed in accordance with the *acquis* in the long term but this does give Croatia ample opportunity to speed up action, making effective legislation and law enforcement a priority to start with.

Nuclear waste disposal programs are being effectively managed with the necessary funding and legislation in place, although the coordination of different bodies remains an issue. Progress on the acquis is considered satisfactory.

Results

The review findings reveal that the energy sector in Croatia is partially subject to free market conditions with substantial state control in most arenas. Although the EU acquis demands the creation of a transparent and competitive energy sector for accession, the challenges for Croatia are formidable in achieving it. The legal and institutional framework for establishing such principles have been put in place and support for developing new energy strategies is observed. The question of security of supply remains unanswered with Croatia importing more than half its energy demand but with the establishment of the SEEREM, the effects of a disruption may be mitigated.

The electricity market has experimented with market based auctioning of TSO allocations but strictly on a priority basis. It is yet to emerge into a secure, liquid and standard model with autonomous functioning. Certain obstacles like political disincentives from privatization are prevalent but the investment scenario looks promising especially in RES. The use of RES is well but inadequately promoted with economic and legal intervention in spite of political and social acceptance and research expenditure being areas of concern. Finally, Kyoto targets for carbon emissions in Croatia are expected to be exceeded in the short term due to rising consumption of energy, also giving rise to abatement costs.

Conclusion

The energy sector in Croatia is well suited for EU integration satisfying most criteria although it may not materialize within the anticipated timeline. The integration of Croatia with the SEEREM will prove to be a platform for a step wise transition into the EU. Efforts to successfully implement EU regulations will depend much on information sharing and co-operation between SEE nations. The transparency of state intervention and policy should be regulated by independent bodies subject to international scrutiny based on performance indicators.

Further research should concentrate on the role of government in enforcing regulation, fuel switching and transportation policy, investment analysis in nuclear and hydropower projects also taking into account the external costs of the same and impacts of power trade and transmission rights between SEE nations.

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